

The Analysis of the Relationship between Environmental Quality Level and Sale Price of Housing in the City of Tabriz Using Principal Components Analysis

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Extended abstract

1. Introduction

Focus on the studies of the environmental quality goes back to the 1960s (Connerly & Marans, 1985). The importance of the studies of the environmental quality stems from the measurement and comparison of different housing environmental potentials (Sive & Chertok, 2013), because the measurement and comparison of environmental quality between different areas, not only for researchers but also for residents, workers, managers and policy makers in the public and private sectors are important (Blomquist, Berger & Hoehn, 2001). Although quite detailed studies on environmental quality assessment have been done, the criteria are not developed in the operational programs.

To check the environmental quality of housing, researchers have focused on three main issues. The first issue is to review the relationship between environmental quality of residential areas, welfare and comfort of the inhabitants. The latter focuses on the sense of the inhabitants' satisfaction of the house and its surroundings. Finally, the third issue is related to the environmental quality as a factor in structure of housing price. The literature of this paper is organized according to these three themes. Different researches have used several different methods and indicators for measuring environmental quality and gathered some instances for heterogeneous areas of cities in different time periods (Kamp, Leidelmeijer,

Marsman & Hollander, 2003). It is expected proposing new topics for Tabriz metropolis helps to clarify the issue.

Several studies have been conducted regarding to the impact of environmental features on housing prices. Almost all studies in this field were exploratory and focused on the impact of environmental quality on housing prices. Rosiers, Theriault, Kestens & Villeneuve (2007) have defined environmental quality as one of characteristics of neighborhood units and evaluated the impact of these components on housing prices. They found that all the characteristics of neighborhood units are important and make a positive effect on housing prices. In the analysis of distribution of spatial inequalities of access and environmental quality in the metropolitan area of Paris, Palma, Kiarash, Picard & Waddell, (2007) recognized major investments of local-welfare facilities in the housing market. The importance of different environmental attributes associated with housing prices was assessed by Chau, Yung, Leung & Law, (2006) through exploring residents' environmental sense. Also Potepan (1994) concluded that the sale price of housing depends on the amenities associated with the residential area of neighborhood units and despite the high cost of housing, prosperous areas are selected in migration to cities. In a more general perspective, Rogerson (1999) has investigated the impact of absorbing new investments on environmental quality in urban development patterns.

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Obviously, the components of the promotion of environmental quality section are of particular importance, which have a positive impact on both housing prices and rental prices. Instead of determining the effect of the price of environmental quality on housing prices, this exploratory study addresses the relationship between the level of environmental quality and housing prices. In this paper, environmental quality is assessed on the basis of environmental and housing characteristics and subsequently a consistent relationship between the level of environmental quality and housing prices is reviewed. The geographical scale of the study area covers 29 neighborhoods in the city of Tabriz. The range of indicators is the level of environmental quality for residential areas that includes both objective and subjective-perceptual indicators. It also ranks the level of environmental quality for residential areas based on geographic levels.

2. Methodology

Tabriz metropolitan indicators are a set of multidimensional data over time included the objective and subjective characteristics of the residential environments. In this paper, we selected 28 indicators of environmental quality. These indicators have been classified into six main groups: 1) social indicators, 2) economic indicators, 3) indicators of access, 4) perceptual problems of housing environment, 5) satisfaction of the housing environment and 6) housing characteristics. Social indicators describe the number of persons per household, educational level, population increase and crime rates in residential areas.

3. Results

Three distinct groups in the metropolitan areas of Tabriz are introduced through the level of environmental quality indicator. In 4 of 29 neighborhoods, the level of environmental quality indicator is greater than 1 and in other sets, the level of 14 neighborhoods is below zero. Also in 11

districts, the environmental quality indicator is between 0-1.

Despite some exceptions, compatibility between environmental quality indicator and sale price of housing in the metropolitan area of Tabriz is remarkable. The three dispersion diagrams provide the evidences of positive linear relationship (slope = 1402/0). However, this analysis is exploratory. To test the intensity of linear relationship between housing prices and the level of the environmental quality indicator, the test of correlation coefficient was used. The test proves that there is a strong and positive correlation between the level of environmental quality indicator and the sale price of housing (The Pearson correlation coefficient is 0.596 and is significant at 0.01). This means that the rising level of environmental quality indicator refers to the increasing prices of housing and vice versa. Although the correlation coefficient confirms the linear and positive relationship between two variables, it does not reflect the dependency between them. To test the dependency between the level of environmental quality indicator and housing sales prices, the chi-square test was used. The null hypothesis is that the two variables are independent and the variable to be tested against these two variables is dependent. The results of the test proves that these two variables are related to each other (chi-square = 19,432, sig = 0,008); as a result, any change in the level of environmental quality indicator means a change in the price of housing. In addition, the level of probability coefficient is close to 1, which confirms the high dependency between two variables.

The results are: 1. there is a strong and positive correlation between the level of environmental quality indicator and sale price of housing in the metropolitan area of Tabriz 2. The level of environmental quality indicator and the average sales price of the housing are dependent variables.

4. Conclusion

In this study, the relationship between the level of environmental quality and sale price

of housing in metropolis of Tabriz was investigated. The study was conducted in two stages. Firstly, the environmental quality indicator was developed using principal component analysis. Secondly, the relationship between environmental quality indicator and sale price of housing was investigated. Therefore, the correlation coefficient and chi-square tests were used. The results show that there is a strong and positive linear relationship between the environmental quality indicator and the sale price of housing in the metropolitan area of Tabriz and the environmental quality indicator and the sale price of housing are dependent variables.

The results of the study are important for several reasons. The results increase the understanding of the residents' environmental sense and the assessment of the environmental characteristics associated with the residential environment and can be used by decision makers in the public and private sectors, including planners, allowing

them to obtain environmental quality indicator at the district level through a comprehensive view. Also, the results indicate that the environmental quality of residential areas can be part of the metropolitan area's competition, because the higher the level of environmental quality indicator in a given area is, the more the housing price in that area will be.

The main limitation of this study is the lack of time series data. The analysis is based on limited data that doesn't provide an opportunity to control and monitor periodically. Therefore, improving the environmental quality indicator based on criteria such as the number of family members, stage of life cycle and duration of residence can be the subject of subsequent studies.

Key words: Environmental quality, housing sale price, indicators, statistical analysis, Tabriz neighborhoods.

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